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SMALLPOX

THE NATURE OF THE DISEASE AND HOW IT MAY BE CONTROLLED

PREVENTION BY VACCINATION

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SMALL-POX *

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Small-pox, perhaps more than any other disease, has inspired fear and terror in the popular mind because of its loathsome appearance, its extreme contagiousness and its disfiguring consequences.

Lord MacCauley's Description of Small-Pox.—Lord MacCauley, writing of the untimely death from small-pox in 1694, of the young and beautiful Queen Mary of England, gives us a powerful pen picture of the ravages of this pestilence:

> That disease, over which science has since achieved a succession of glorious and beneficent victories, was then the most terrible of all the ministers of death. The havoc of the plague has been far more rapid, but the plague has visited our shores only once or twice within living memory; and the small-pox was always present, filling the churchyards with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on those whose lives it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover.

Blindness from Small-Pox.—During certain periods in England, a very large percentage of the people were pockmarked. Ben Johnson, the Elizabethan dramatist, wrote:

> Envious and foule disease, could there not be,
> One beautie in an age and free from thee.

Not only did the disease destroy life, disfigure and maim, but it was at one time the most common cause of blindness. The early records of the London Asylum for the Indigent Blind, showed that two-thirds of the inmates had lost their sight as a result of small-pox.

Small-Pox Adages.—Small-pox was a great scourge before the introduction of vaccination. In London during the eighteenth century it caused one-twelfth of all deaths. Everyone felt that he had to pass through an attack of small-pox at some period of his

* This pamphlet is one of a series on public health, prepared by the Council on Health and Public Instruction of the American Medical Association. Other pamphlets can be secured from the American Medical Association, 535 North Dearborn Street, Chicago.

life. One of Horace Walpole's correspondents, (Walpole's Letters) wrote: "Poetry is as universally contagious as small-pox: Everyone catches it once in a lifetime at least, and the sooner the better." The Germans had a proverb which expressed the same thought: "From love and small-pox but few remain free." Most children in London contracted small-pox before the age of 7.

Fig. 1.—Normal appearance of site of vaccination, first day.

Extent of Small-Pox.—In the City of London, from 1700 to 1800, in a population varying approximately from 600,000 to 750,000, there were only nine years throughout the century when the deaths from small-pox declined below 1,000: taking the entire century the deaths averaged almost 2,000 per annum. This would represent more than 10,000 attacks of small-pox annually, as less than one in five victims died. Small-pox did not occur in epidemics, as at present, for it was present continuously.

Small-Pox Infection in Clothing.—Small-pox is one of the most contagious of diseases. The infection is usually transferred directly from one individual to

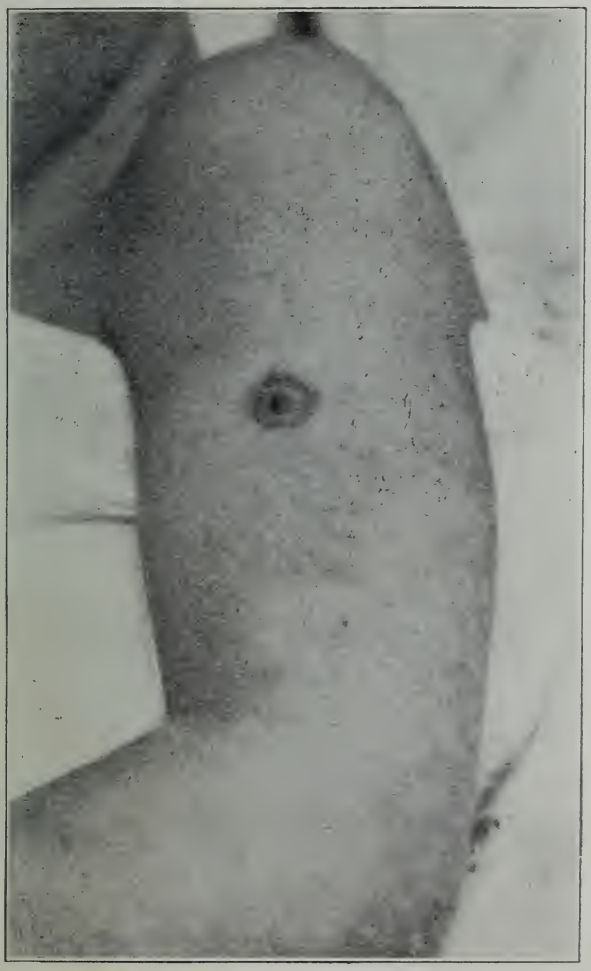

Fig. 2.—Normal appearance of vaccination site, fifth day.

another through the atmosphere, but it may be transmitted through infected clothing and other objects. In the small-pox epidemic of 1901-1904, in Philadel-

phia, a number of cases of small-pox broke out among the salesmen in a large clothing store; the infection was traced to a window-dresser whose daughter was suffering from small-pox at home, and the contagion was, beyond reasonable doubt, carried to the store by the infected garments of the father.

Fig. 3.—Normal appearance of vaccination site, seventh day.

Small-Pox Sufferers Traveling on Trains.—Persons suffering from small-pox in the early stages sometimes travel long distances on railroad trains. On one occasion, a young woman heavily veiled, and suffering from what later proved to be a very severe attack of small-pox, traveled in a day coach from

Atlantic City to Philadelphia in order to enter a hospital in the latter city. A large number of people were exposed to the infection of the disease without suspecting their danger. I have personal knowledge of other patients traveling hundreds of miles on railroads, while in an actively contagious stage of the disease. Such experiences are a sufficient answer to those per-

Fig. 4.—Normal appearance of vaccination site, ninth day.

sons who lull themselves into the false security that they can avoid exposure to small-pox.

THE MILD TYPE OF SMALL-POX

Different Types of Small-Pox.—Since 1896, there has been widely prevalent in the United States, a peculiarly mild type of small-pox which kills only a very small proportion of those attacked. Hundreds of thousands of such cases have occurred throughout the country. This mild type is doubtless due to the weakness of the infecting germ. Two entirely different

types of small-pox have prevailed in this country—one the virulent imported variety which destroys the lives of one-quarter of those whom it attacks, and the other the mild type above referred to. An interesting feature of the latter type is that it is not only mild as to mortality but also as to its contagiousness; practically it

Fig. 5.—Normal appearance of vaccination site, fifteenth day.

attacks only the unvaccinated, and vaccinated persons even if the vaccination dates back thirty or more years, are, as a rule, protected against it. The opponents of vaccination point to this mild type of small-pox and say that the disease has lost its terrors. Those who are thoroughly familiar with the subject, however, know

that neglect of vaccination may prepare a community for a death-dealing epidemic of the classic type of the disease.

SMALL-POX A CRUEL DISEASE

Early Symptoms.—The patient, during the early stages of a classic attack of small-pox, suffers from a pronounced chill, followed by sudden fever and severe headache and backache: nausea and vomiting occur with great frequency and the latter may persist for several days. Dizziness and general aches and pains are common. In severe cases, there is great weakness

Fig. 6.—Infant born in the small-pox wards of the Philadelphia Municipal Hospital. Vaccinated immediately and protected against small-pox. (From Acute Contagious Diseases, Welch and Schamberg; published by Lea Bros., Philadelphia.)

and prostration. During this stage, while the symptoms may be most suggestive of small-pox, no positive diagnosis can be made as the "grip" and certain other infections may imitate the early symptoms of small-pox. Not until the eruption appears can one be absolutely sure of the nature of the disease. Many persons are commonly exposed to small-pox before the diagnosis can be definitely established.

Eruptive Stage.—About the third day of the illness, the fever abates, the pains subside and the patient begins to feel that his illness is at an end. But he is

woefully mistaken, for it has barely begun. At this time the eruption makes its appearance; it is not formidable at first sight and looks not unlike a multitude of flea-bites on the face, hands and elsewhere. Soon it spreads over the greater part of the body. From day to day the eruption undergoes a change (see Figs. 1-7); soon the face is covered with numerous pustules, the

Fig. 7.—Typical "take" of vaccination showing necessity of revaccination at intervals. Patient relied on previous scar as showing immunity.

features are swollen beyond their normal proportions and the patient disfigured beyond recognition. The fever again rises and acquires the characteristics of blood-poison fever. The patient suers greatly from the soreness occasioned by the multitudes of pustules present, particularly those on the hands and feet. In severe cases the pustules may reach the enormous number of 30,000 to 40,000. The presence of small-pox sores in

the nose and mouth cause great difficulty in breathing and great distress in swallowing.

The Plague of Boils.—At about the end of a fortnight, the patient if he recovers, has passed through the height of the eruptive process, and is led to believe that he is on the road to convalescence. Now a new plague attacks the unfortunate victim, for he begins to be the subject of boils and abscesses which may number but a half-dozen or may reach a hundred or more. In a proportion of small-pox cases, which varies with the severity of the attack, one or both eyes may be lost, with consequent impairment or loss of vision.

An attack of unmodified small-pox runs its course in about five or six weeks. At its conclusion, the patient exhibits on his countenance numerous disfiguring pits and scars which remain throughout his life as a sad reminder of the cruel malady through which he has passed.

Small-pox, in its usual form, is a terrible disease and there is an almost universal susceptibility of the human family to its infection, but there is no malady against which science possesses a surer and more complete safeguard. For that great discovery, the world is indebted to Edward Jenner.

DR. EDWARD JENNER, WHO INTRODUCED VACCINATION

Honors Conferred on Jenner.—Dr. Edward Jenner, of Berkeley, England, announced to the world in 1798, what was later generally regarded as the "greatest discovery ever made for the preservation of the human species." Jenner proclaimed his discovery in a modest pamphlet which excited the attention of the entire civilized world. When the truth of his conclusions was established, honors fell fast on him. The British parliament voted him $50,000 in 1802, and five years later a second grant of $100,000. He was made physician extraordinary to the king of Great Britain. The most distinguished scientific bodies throughout the world vied with each other in conferring degrees on the illustrious but modest physician. Within twenty-one years, Jenner received no fewer than 28 diplomas from institutions of learning, and within a period of six years, eight medals were struck in Europe in honor of the great discovery, one of these being the most beautiful of the Napoleonic series. Many of the crowned heads

of Europe addressed complimentary epistles to Jenner, and a letter from the discoverer constituted the best passport through foreign countries in time of war.

Fig. 8.—Two children in the Municipal Hospital of Philadelphia, in 1903. One unvaccinated, the other vaccinated on the day of admission. Crust of vaccination still seen on leg. This child's mother had small-pox and child remained with her in the hospital for three weeks; was discharged perfectly well. The unvaccinated child, admitted with small-pox, died. (From Acute Contagious Diseases, Welch and Schamberg.)

THE CLAIMS FOR VACCINATION

Duration of Protection After Vaccination.—A recent successful vaccination will confer protection against

Fig. 9.—Three members of one family brought to the Municipal Hospital of Philadelphia with the mother and father, who had small-pox. Child in center was not vaccinated, as it was considered too young. The other children were vaccinated one year before, and remained free of the disease although living in the small-pox wards for several weeks. (From Acute Contagious Diseases, Welch and Schamberg.)

small-pox in at least ninety-nine out of one hundred individuals. An infant successfully vaccinated can not contract small-pox even though it be placed in bed with a person suffering from this disease. This has been abundantly proved in every small-pox epidemic in every country. After a lapse of five or ten years, the susceptibility to small-pox may in part return, and the individual may require revaccination to reestablish immunity against small pox. An attack of small-pox, scarlet fever, measles or chickenpox leaves in the system a protective substance, which, in the vast majority of instances, safeguards the individual against a second attack. There are, to be sure, some highly susceptible subjects in whom the immunity is not permanent, and who may, on future exposure, contract a second attack of the disease. Second attacks of small-pox are rare.

How Vaccination Protects.—Vaccination, which is the result of the inoculation of a virus closely related to small-pox, protects against the latter disease much in the same manner as one attack of small-pox confers protection against a second, save for the fact that the immunity is not, as a rule, of so long duration and requires renewal. It is not claimed at present that a single vaccination will invariably protect against small-pox for life. Such life-long protection is sometimes conferred, but, in most instances, the protection wears out in the course of years and requires to be renewed. The period of protection after the primary vaccination is scarcely ever less than five years and not infrequently covers a period of from ten to twenty years. After a second successful vaccination, the individual is in the majority of instances protected against small-pox for life.

When the term "vaccination" is employed, a successful vaccination is of course referred to. The mere production of a sore arm without the typical course of the vaccine affection gives no protection whatsoever. There are doubtless many persons who rest under the false security of immunity against small-pox, in whom genuine vaccination has never resulted, and who, on exposure to small-pox, would take the disease.

Unsuccessful Vaccinations.—Occasionally instances are encountered of persons who have been vaccinated a number of times, but never successfully. Sometimes these persons contract severe and even fatal small-pox.

Fig. 10.—Father and child. Child, vaccinated, escaped the disease.

One such case was a physician who had been vaccinated seven times but without result. Such persons have a low susceptibility to vaccinia but not necessarily to small-pox. Commonly a good active vaccine virus will "take" after weaker lymphs have failed.

Fig. 11.—Mother and daughter. The daughter, through vaccination, although exposed, did not contract the disease.

PROOF OF THE EFFICACY OF VACCINATION

Unanimity of Opinion on Vaccination.—Proof of the efficacy of vaccination as a safeguard against small-pox is based on more than a century's experience with this measure. There is no one fact in medicine which

is more conclusively demonstrated. Doctors disagree on many things, but there is practical unanimity of opinion on the value of vaccination. There are a few physicians who are opposed to vaccination, but they

Fig. 12.—Mother seen in Figure 11, front view. Typical distribution of eruption.

constitute but a minute fraction of 1 per cent. of the profession. There is no medical scientist of prominence in the United States who is not an ardent advocate of this protective measure.

Fig. 13.—Sisters suffering from small-pox. The one on the right successfully vaccinated in infancy, but not since, contracted a mild small-pox, but recovered without scarring. The girl on the left developed a severe small-pox which threatened her vision and life. She recovered, badly disfigured. (From Acute Contagious Diseases, Welch and Schamberg.)

Well-Protected Countries.—Convincing proof of the life-saving power of vaccination is furnished by massive statistics gathered from Germany, Cuba, Porto Rico, Philippine Islands and other countries where vaccination has been thoroughly carried out. The statistical evidence of the efficacy of vaccination is overwhelming, but space will not permit its inclusion in this pamphlet.

Crucial Experiments on Monkeys.—Scientific proof of the protective power of vaccination is definitely established by tests on the monkey, the only animal besides man that can be given generalized small-pox by inoculation. If the monkey is inoculated with small-pox virus, he acquires a mild form of small-pox of the type purposely produced in the eighteenth century to protect people against the more severe natural small-pox. If, however, the monkey is first vaccinated, it is utterly impossible to give him small-pox. This is a complete confirmation of the tests carried out by Jenner and others on human subjects more than a century ago, and constitutes evidence of the most irrefutable character of the protective value of vaccination against small-pox.

IMMUNITY OF VACCINATED PHYSICIANS, NURSES, AND ATTENDANTS IN SMALL-POX HOSPITALS

If it can be demonstrated that physicians, nurses and attendants in small-pox hospitals can be perfectly protected by vaccination, then this must be regarded as a crucial test of its protective influence; for if these persons, living in the same atmosphere with scores or hundreds of small-pox patients, breathing their very exhalations, are enabled to escape the infection, it certainly should be possible for others much less exposed to acquire similar immunity.

Protection of Persons in Small-Pox Hospitals.—Experience shows that physicians, nurses and attendants, if recently successfully vaccinated or revaccinated may live in small-pox hospitals in perfect safety. Dr. Marson, physician to the Small-pox Hospital of London for many years, giving evidence in 1871, stated that during the preceding thirty-five years no nurse or servant at the hospital had been attacked with small-pox. Dr. Marson took the precaution of revaccinating all attendants before permitting them to go on duty.

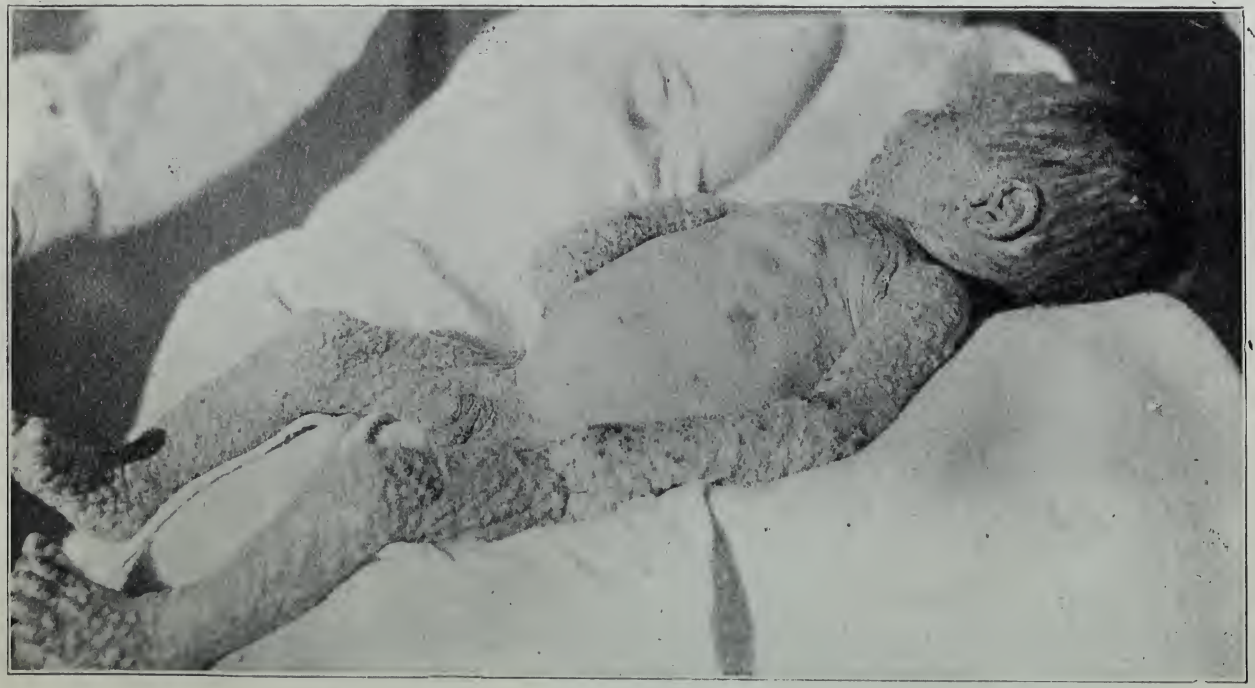

Fig. 14.—Fatal small-pox in an unvaccinated infant, 1 month old.

Dr. Collie, whose experience is also large says: "During the epidemic of 1871, out of one hundred small-pox attendants at Homerton (England) all but two were revaccinated, and these two took small-pox." Dr. T. F. Ricketts, medical superintendent of the small-pox hospital ships on the Thames, states that out of 1,201 persons in attendance on board the small-pox ships, only six contracted the disease, all of them recovering. None of these six persons had been successfully revaccinated before going on duty. According to Dr. Hill, of Birmingham (England), during the epidemic of 1893, over one hundred persons were employed at the city small-pox hospital, all of whom had been recently revaccinated; not one of them contracted small-pox.

Dr. William M. Welch, of Philadelphia, states that, in the Municipal Hospital of Philadelphia during a period of thirty-four years, in which time almost 10,000 cases of small-pox were treated, there was no instance of a physician, nurse or attendant, who had been successfully vaccinated or revaccinated prior to going on duty, contracting the disease.

IMMUNITY OF MEDICAL STUDENTS VISITING SMALL-POX HOSPITALS

Medical Students in Chicago and Philadelphia.—In the city of Chicago, Dr. Heman Spalding has, since 1899, taken thousands of medical students into the wards of the small-pox hospitals for instruction in diagnosis. All of the students were previously vaccinated. Of this large number *not a single student contracted the disease.* From 1901 to 1904, during an epidemic of small-pox in Philadelphia, about 700 medical students were taken in small classes through the small-pox wards of the Municipal Hospital. But one student contracted small-pox and he had evaded vaccination and, indeed, came of an antivaccination family.

ALLEGED DANGERS OF VACCINATION

Some Risk in All Human Acts.—Every human act is accompanied by some measure of danger. When one rides in an elevator, in a railroad car, or even promenades on the sidewalk, he takes a certain definite risk which can be mathematically calculated. While in the aggregate, the number of accidents and deaths from each of these causes may be considerable,

Fig. 15.—Typical distribution of eruption in a case of small-pox. (From Acute Contagious Diseases, Welch and Schamberg.)

yet the individual risk is so small that it may be disregarded. It is the same with reference to vaccination. Inasmuch as this procedure necessitates the production of an abrasion or wound it naturally is liable to infections to which wounds from other causes are subject.

Fig. 16.—Severe small-pox, showing large pustules. (From Acute Contagious Diseases, Welch and Schamberg.)

Most of these infections occur in persons in whom regard for cleanliness and for the subsequent care of the vaccination are neglected.

Physicians Well-Vaccinated Class.—If there is any class of men in the community who should be familiar

with the accidents and complications of vaccination, it should certainly be the physicians. With this knowledge in their possession, medical men regard vaccination as so safe a procedure that they almost universally employ this measure on themselves, their wives and

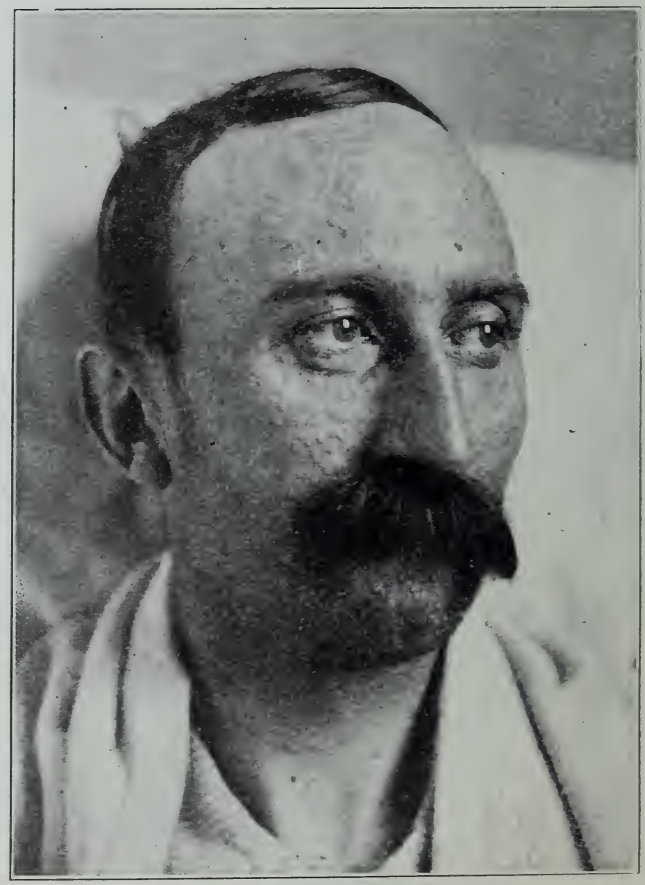

Fig. 17.—An unvaccinated man exhibiting the development of a moderately severe attack of small-pox. Third day of eruption. (From Acute Contagious Diseases, Welch and Schamberg.)

their children. Indeed, physicians and their families constitute the best-vaccinated class in the community. English statistics show that only thirteen medical men per million die of small-pox as against seventy-three

per million of the general population. The contrast is all the more striking in view of the fact that physicians are more exposed to small-pox than the average citizen.

U. S. Public-Health Service Supervision.—Practically all of the accidents of vaccination are prevent-

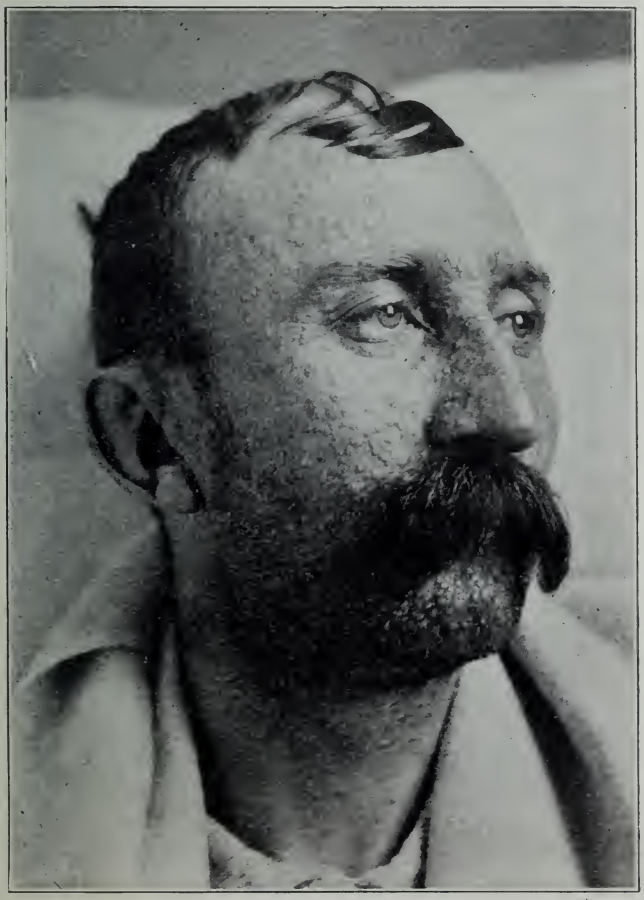

Fig. 18.—Fourth day of eruption. (From Acute Contagious Diseases, Welch and Schamberg.)

able by the selection of the proper virus and care of the arm during and after vaccination. The United States Public-Health Service has supervision over the products of vaccine establishments and has the power

to revoke the license of a firm placing impure virus on the market. Frequent examinations of virus for purity are made by government experts.

The danger from vaccination has been enormously exaggerated by the opponents of this measure. When we consider the thousands on thousands of vaccina-

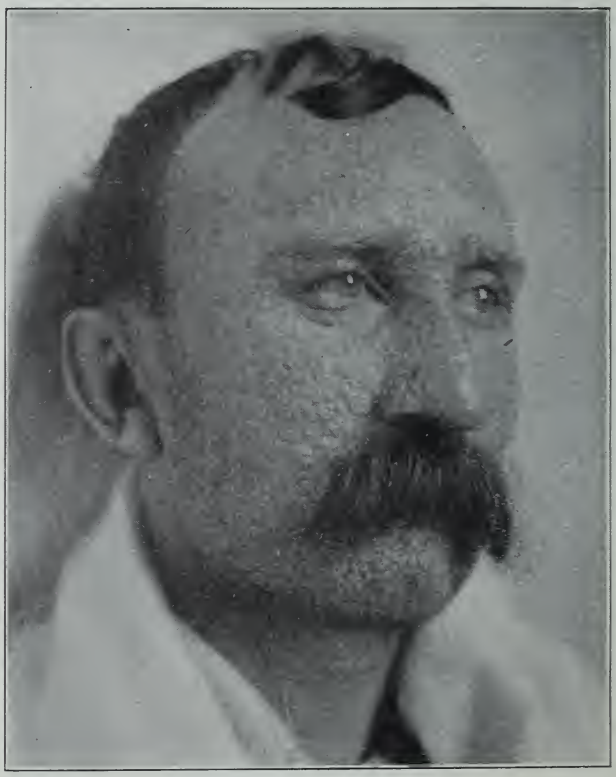

Fig. 19.—Sixth day of eruption. (From Acute Contagious Diseases, Welch and Schamberg.)

tions performed even on the unclean and under unfavorable circumstances, and note how rare it is for any serious complication to develop, we are justified in concluding that the risk attending vaccination in any individual case is practically a neglible quantity. *The danger connected with vaccination is slight compared with the peril of remaining unvaccinated.*

Remarkable Results of Vaccination in the Philippines.—Dr. Victor G. Heiser, Sanitary Director of the Philippine Islands (Report of the Philippine Commission, and of the Secretary of the Interior, part 2, 1907), states that, up to 1907, over 2,000,000 human beings in the Philippines had been vaccinated by the

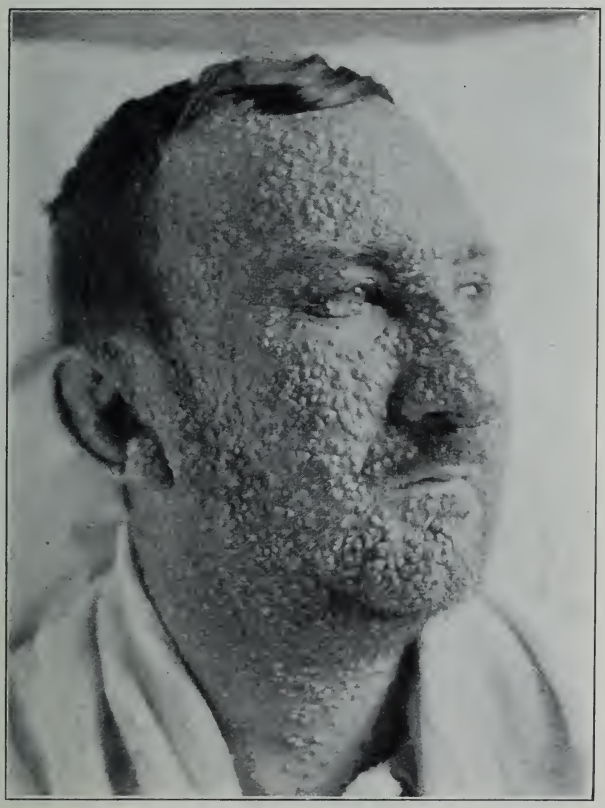

Fig. 20.—Eighth day of eruption. (From Acute Contagious Diseases, Welch and Schamberg.)

United States authorities without the loss of a single life or limb and without any serious case of infection. This remarkable record shows what a safe procedure vaccination is.

OPPOSITION TO VACCINATION

Opponents of Vaccination Not Technically Qualified.—The reader might pertinently ask, If vaccina-

tion is such a wonderful preventive against a loathsome pestilential disease, why should there be any opposition to it? People have a natural antipathy to coercive measures; this applies not exclusively to vaccination but also to quarantine and forcible removal to the hospital. All of these are measures designed for the public welfare and come within the exercise of

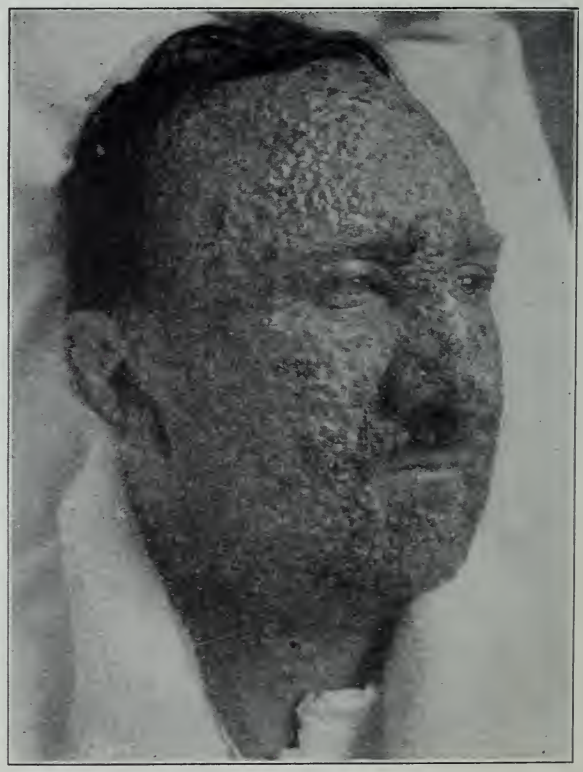

Fig. 21.—Twelfth day of eruption. (From Acute Contagious Diseases, Welch and Schamberg.)

police power. As a matter of fact, there is very little opposition to vaccination except in localities where there is much agitation against the procedure. If some unfortunate complication follows a vaccination, no matter whether or not it be due to neglect on the part of the patient, the antivaccinationists place the blame on the vaccine virus. The opponents of vaccination in

this country are made up of perfectly sincere but woefully misguided laymen who are not qualified by technical training to pass judgment on a medical question, and a sprinkling of physicians who have no scientific sense of proportion. The great physicians and the eminent medical scientists of the country are as a unit in favor of vaccination.

Fig. 22.—Fourteenth day of eruption. (From Acute Contagious Diseases, Welch and Schamberg.)

Vaccination Compulsory in All Armies and Navies. —All of the civilized countries of the world have found it desirable to make vaccination compulsory in their armies and navies, and in most instances, obligatory in one form or another for the civil population. Government Commissions in England, Denmark, Germany and the United States which were appointed to investigate vaccination, have unqualifiedly approved this measure as a safeguard against small-pox.

HOW TO AVOID VERY SORE ARMS

Improper Care of Vaccinated Arms.—Nearly all very sore arms and the vast majority of the complications of vaccination are due to maltreatment of the

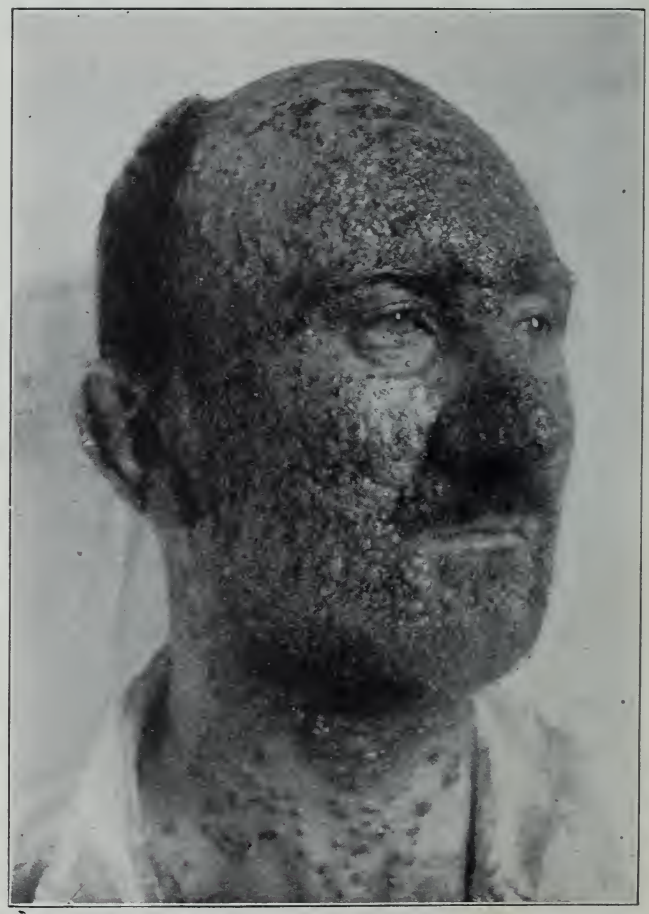

Fig. 23.—Sixteenth day of eruption. (From Acute Contagious Diseases, Welch and Schamberg.)

arm after vaccination. Many children injure the vaccination through rubbing, scratching or other violence resulting in tearing off of the scab or having it become adherent to the underclothing. Such a state of affairs

favors increased inflammation and infection with various germs, and is the most fertile cause of complications. These cases bring vaccination into disrepute; the cause of the trouble is, in 99 out of 100 cases, not the vaccine virus, but the improper care of the arm afterwards. Physicians should therefore give more

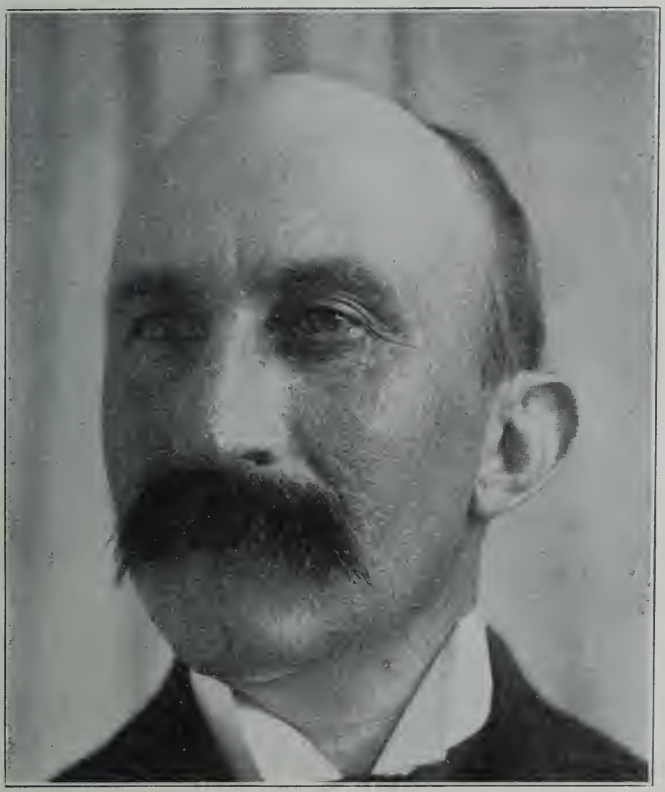

Fig. 24.—Appearance of patient after recovery. Scarring present but not deep. (From Acute Contagious Diseases, Welch and Schamberg.)

detailed information to parents concerning the care of the arm after vaccination. Furthermore, parents should be told what symptoms to expect after vaccination and when the vaccinated subject cannot be kept under observation by the physician, they should report to him any undue development in the vaccination.

COURSE OF VACCINATION

1. After a child is vaccinated a small reddish blood-crust forms at the site of the abrasion.

2. About the fourth day the inoculated area becomes reddened and is slightly raised above the surface.

3. About the sixth day a pearl-colored flat blister or vesicle is formed, containing a clear fluid.

4. The vaccination reaches its height about the eighth or ninth day; there is a flat blister with a dark central caving in; around the blister there is a zone of redness with some swelling.

5. The contents of the vesicle is now changed to a creamy or purulent fluid: the glands in the armpit become tender and slightly enlarged, and a slight elevation of temperature may be present for a day or two.

6. The vesicle now becomes darker in color and drier and is gradually converted into a hard mahogany-colored crust which remains attached for at least three weeks. The retention of this crust on the arm until healing has taken place beneath, is the best protection to the vaccination site.

CARE OF THE ARM AFTER VACCINATION

1. Vaccination, of necessity, produces a wound on the skin; this wound may like other wounds, become infected with various germs if cleanliness is not observed.

2. Nearly all of the injuries after vaccination are due to neglect of the vaccination. Germs of blood-poisoning, and even those of lockjaw may get into the wound if the vaccination is left unprotected, scratched or comes into contact with dirty clothes and the like.

3. Shields should not be allowed to remain on the vaccination, as undue inflammation and infection may result. A small, perforated, linen shield may be placed over the vaccination for a few hours until it dries. It should then be removed.

4. The best protection to a vaccination is given by the application of a half-dozen layers of sterile gauze (cheese-cloth, 3 by 4 inches, wrapped in unprinted paper and baked in a stove oven for about a half-hour, will suffice). The gauze should be held on the arm by a gauze bandage or strips of adhesive plaster.

5. The gauze should be applied shortly after vaccination and should be kept on constantly.

6. Clean gauze should be applied every few days, according to circumstances. The person changing the dressing should thoroughly scrub the hands with soap and hot water beforehand.

Fig. 25.—Severe scarring and loss of hair following small-pox. Patient unvaccinated. This patient also lost an eye from the disease. (From Acute Contagious Diseases, Welch and Schamberg.)

7. Care should be taken by the vaccinated person to avoid having the arm bruised or injured in any way.

8. If the gauze sticks to the vaccination, and is not easily removed, a hot 2 per cent. solution of carbolic acid in water or similar antiseptic should be poured on the gauze to loosen it.

9. In the event of any undue inflammation or of any illness of the patient, a physician should be consulted.

10. Patients may take baths in a tub in a sitting position, but the gauze dressing should not be allowed to get wet.

11. An excellent method of treating the vaccination site and one which increases the comfort of the sub-

Fig. 26.—Destruction of eyeball due to small-pox. Patient unvaccinated. (From Acute Contagious Diseases Welch and Schamberg.)

ject and lessens inflammation and liability of infection, is to paint over and around the vaccination each day (beginning forty-eight hours after vaccination), a 2 per cent. solution of picric acid in 70 per cent. alcohol. This should be continued daily until the crust has become quite hard, which it will under this treatment

from the tenth to the fifteenth day. Later, carbolized vaseline may be applied. After painting, the arm should be covered with gauze and a bandage.

HOW TO CONTROL AND PREVENT SMALL-POX

1. Any person suspected of having small-pox should be isolated in an appropriate apartment and no one permitted to see him except those in medical attendance.

2. The proper health authorities should be immediately informed, by telephone if possible, of the existence of a small-pox suspect.

3. If the case proves to be small-pox, the patient should if possible, be immediately removed to an isolation hospital.

Fig. 27.—Destruction of eyeball due to small-pox. Patient unvaccinated. (From Acute Contagious Diseases, Welch and Schamberg.)

4. When small-pox is first suspected, all who reside in the domicile and all who have been in contact with the patient, should be vaccinated or revaccinated.

5. Careful inquiry should be made to ascertain the names and residence of all "contacts," in order that

they may be located and vaccinated. Otherwise, numerous foci of infection may be established and lead to a wide-spread epidemic.

6. In vaccinating "contacts" it is well to make at least two insertions of the lymph, in order to lessen the chances of failure.

7. If the small-pox patient is sent to a hospital, the house should be thoroughly disinfected, and if the conditions warrant, the inmates, if vaccinated, may be allowed their freedom under surveillance. They should be most carefully examined between the eighth and eighteenth days after the first exposure. Most persons who fall ill, exhibit symptoms about eleven days after exposure, although with the prevailing "mild type" the incubation may be longer than eighteen days

8. If the patient is treated at home, the house with all of the inmates must be strictly quarantined, until the termination of the case and disinfection of the premises.

9. After the recovery or death of the patient, the house with all of its contents should be disinfected by formaldehyd. The mattress on which the patient has lain had better be burned if facilities are not at hand to disinfect by superheated steam.

10. Schoolchildren residing in a house visited by small-pox should not return to school without authorization from the school or health authorities. School or library books should not be returned until after special disinfection.

11. In case of death, the body should be wrapped in a sheet saturated with 1:500 mercuric chlorid solution, placed in a sealed coffin and buried within twenty-four hours, according to regulations of the Board of Health of the district. Of course, no public funeral services can be held in the home of the patient.

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